

South Polar Residual Cap 3D products from HRSC, CTX and HiRISE

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The need for South Polar Residual Cap 3D Products



Not enough HRSC DTM coverage (Putri, et al., in-submission, 2017)



Scales for Current DTM compared to Current Resolution (Gwinner and Willner, 2016)





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The need for South Polar Residual Cap 3D Products



Missing MOLA data from 87°-90°S



Swiss Cheese Terrain (False colour display of CRISM scene 00005D24) (Campbell, et. al, 2016)



Ice layers (ESP_047087_1065) NASA/JPL/UoA)



Spider-like morphology

(MOC) (Piqueux, 2003)

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A lot of dynamical phenomena



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HRSC DTM Production







Kim and Muller, 2009



No seasonal effect for stereo processing (courtesy of Calvin, et. al, 2016)



H4917 0000 DTM

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HI SHULL SHOUL

HRSC DTM and ORI products

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Collage of HRSC Digital Terrain Models (Putri, et al., submitted, 2017) Collage of HRSC Orthorectified Images (Putri, et al., submitted, 2017)







Agreement with MOLA Values

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Seasonal and Annual Stability, Coregistration



H2189 0000, 27-09-2005, MY27, Ls 322.06 H4837 0000, 09-10-2007, MY28, Ls 327.62





H2189 0000 H2163 0000, 20-09-2005, MY27, Ls 291.64 H2189 0000, 27-09-2005, MY27, Ls 296.05

(Putri, et al., in-submission, 2017)



H2181 0000,17-09-2005, MY27, Ls 294.6 H2372 0000,17-11-2005, MY27, Ls 325.7



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H2163 0000





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HRSC to CTX to HiRISE

These 3D HRSC Products can be used as base imagemaps for CTX DTMs. Subsequently, the CTX DTMs can then used to produce HiRISE DTM



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CTX Stereopairs over the South Pole HiRISE Stereopairs over the South Pole



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HRSC to CTX (to HiRISE)











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Summary and Conclusions

- 50 m DTMs over the entire South Polar Residual Cap from ESA/DLR HRSC
- Examples of 18m CTX DTMs co-registered to HRSC base ORIs are being generated where available using the UCL CASP-GO DTM generation system
- 75cm HiRISE DTMs will soon be generated which are co-registered to CTX and/or HRSC base



